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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,034	04/05/2000	Tongbi Jiang	3818.1US (98-887.1)	6830

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EXAMINER

KANG, DONGHEE

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 04/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/543,034

Applicant(s)

JIANG, TONGBI

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Acknowledgment

1. Applicant's Amendment and Response to Paper No.6 has been entered and made of Record. Claims 1-15 are pending in this application.

Information Disclosure Statement

2. Acknowledgment is made of receipt of applicant's Information Disclosure Statement (PTO-1449) filed January 28, 2002.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims **1, 4-5, 7-8, & 15** are rejected under 35 U.S.C. 102(e) as being anticipated by Admitted prior art by applicant (Figs.16-18).

APA discloses a semiconductor die assembly comprising (Fig.18):

a semiconductor substrate (234) having a first surface (264) and a second surface (250), wherein said semiconductor substrate includes at least one opening (238) defined therethrough between said semiconductor substrate first surface and said semiconductor substrate second surface; at least one semiconductor die (232) having an active surface (262) with at least one electrical connection area (242) disposed on said semiconductor die active surface, said at least one semiconductor die oriented

having said at least one electrical connection area substantially aligned with said at least one semiconductor substrate opening; at least one adhesive tape (236) interposed between and attaching said semiconductor die active surface (262) and said semiconductor substrate first surface (264), wherein a width of said at least one adhesive tape extends proximate an edge (246) of said at least one semiconductor die to proximate an edge of said at least one semiconductor substrate opening (238); at least one electrical connection (240) extending between said at least one electrical connection area (242) and at least one trace (244) on said semiconductor substrate second surface (250), wherein at least one electrical connection comprises a bond wire; a glob top (256 in Fig. 18) material disposed within said at least one semiconductor substrate opening encasing said at least one electrical connection; and encapsulant material (258) encasing said at least one semiconductor die and said glob top material.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (Figs. 16-18) in view of Admitted Prior Art (Fig. 15).

Fig. 18 does not explicitly teach the electrical connection comprises a Tape Automated Bonding (TAB) connection. It would have been obvious to one of ordinary skill in the art to substitute the bond wire with a well known TAB in order to provide the

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electrical connection. Furthermore, one of ordinary skill in the art would have recognized that the TAB and bond wire are both considered to be an art recognized functional equivalent for providing the electrical interconnection, and therefore an obvious expedient.

7. Claims **2-3 & 9-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (Fig.18) in view of Yaguchi et al. (WO 97/01865).

Regarding claims **2-3 & 11-14**, APA does not teach the adhesive tape extends beyond the edge of the substrate opening, the edge of die to provide a detectable surface within the opening, a fillet proximate the adhesive tape and the die edge, a fillet proximate the adhesive tape and the substrate opening edge, a fillet proximate the adhesive tape and the die active surface, and a fillet proximate the adhesive tape and substrate first surface. Yaguchi teaches the adhesive tape 4 that extends beyond the edge of the lead with an opening a distance into the substrate opening to provide a detectable surface within opening. Yaguchi also show different embodiment where the adhesive tape can be placed in different location between the lead and the die (See Figs. 2, 15, & 17). Therefore, it would be recognized to have the adhesive tape extending beyond the edge of the die on the substrate first surface to provide a detectable adhesive tape surface on the substrate first surface. Furthermore, a well known techniques of applying an adhesive tape to a die or substrate would form a fillet proximate the adhesive tape and the die edge, a fillet proximate the adhesive tape and the substrate opening edge, a fillet proximate the adhesive tape and the die active

surface, and a fillet proximate the adhesive tape and substrate first surface because the adhesiveness of the tape would stick to surface of a die or substrate causing uneven displacement.

Regarding claims 9-10, APA does not teach at least one adhesive tape comprises a planar carrier film including a first surface having a first adhesive disposed thereon and second having a second adhesive disposed thereon. Yaguchi et al. teach a width of the adhesive tape 4 having double coated adhesive film with an adhesive on the first and second surface 4a and 4b to provide strengthening adherence of the adhesive tape to the semiconductor substrate and to the semiconductor die (see page 20, line 9-27). The lead 3 can be substituted by the substrate taught by the APA without changing the scope of the invention. The adhesive would facilitate bond between the substrate and the die. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Yaguchi into the APA's device in order to provide the strengthening adherence of the adhesive tape to the semiconductor substrate and to the semiconductor die.

Response to Arguments

8. Applicant's arguments filed January 24, 2002 have been fully considered but they are not persuasive.

Applicant argues that the prior art does not teach an adhesive tape that extends at least *proximately* an edge of at least one semiconductor die to at least proximate an edge of at least one substrate opening. The word "proximately" is a broad term, which means to approach, come close to, or near. The adhesive tape does not have to be at

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the edge of the semiconductor die and extend to the edge of the substrate opening.

Therefore, the 102(b) rejection anticipates each and every element as set forth in claims 1, 4, 5, 7, 8, and 15.

Applicant argues that there is no motivation to make the proposed combination. This is not convincing. It is well known in the art and conventional to use bond wires or TAB as an electrical elements (see page 3, lines 7). Thus it would have been obvious to one of ordinary skill in the art to substitute the bond wire with a well known TAB in order to provide the electrical connection. Furthermore, one of ordinary skill in the art would have recognized that the TAB and bond wire are both considered to be an art recognized functional equivalent for providing the electrical interconnection, and therefore an obvious expedient.

Applicant argues that there is improper to combine reference where the references teach away from their combination because neither does any combination of admitted prior art and Yaguchi teach or suggest that adhesive tape extends at least proximate an edge of at least one semiconductor die. The examiner respectfully disagrees with that interpretation because the admitted prior art clearly teaches the limitation "adhesive tape extends at least proximate an edge of at least one semiconductor die" as discussed above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Donghee Kang.
April 23, 2002

Steven Loko
Patent Examiner

